

REMARKS

By this Amendment, claims 1, 2, 20, 31, and 38 are amended. Claims 35 and 42 were canceled previously. No new claims are added or are canceled. Accordingly, after entry of this Amendment, claims 1-34, 36-41, and 43-44 will remain pending. Currently, Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are being examined. Claims 4-6, 8, 10-12, 14-16, 18, 21, 23-26, 29, 32-34, 39-41, and 44 have been withdrawn from consideration at this time.

35 U.S.C. § 112

The Examiner has rejected Claim 2 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner states “Claim 2 recites the limitation ‘the thermal insulation assembly’. There is insufficient antecedent basis for this limitation in the claim. Examiner has assumed that the recitation is in reference to the first thermal insulation assembly.”

The Applicants have amended Claim 2 to clarify the invention and believe the 35 U.S.C. 112, second paragraph rejection has been overcome.

35 U.S.C. § 103(a)

In the Office Action dated February 5, 2008, the Examiner rejected claims 1-2, 7, 9, 17, 19-20, 22, and 27 under 35 U.S.C. § 103(a) as being unpatentable over Okase (US 6,228,173) in view of Otsuki (2001/0003271 A1) and Carpenter (2003/0159780 A1).

The Examiner admits, “Okase fails to disclose either or both of the chemical treatment system/chamber or the thermal treatment system/chamber comprising a protective barrier layer formed on at least a portion of an inner surface thereof”.

The Examiner asserts that “Otsuki teaches providing a film of Al_2O_3 and Y_2O_3 on an inner wall surface of a chamber (for heating, plasma, process gas, or a combination of them) and on exposed surfaces of members within the chamber for the purpose of providing high corrosion resistance and insulating properties (abstract).”

The Examiner asserts “It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a protective barrier layer of

Al₂O₃ and Y₂O₃ on at least a portion of an inner surface of either or both of the chemical treatment system/chamber and the thermal treatment system/chamber in Okase in order to provide high corrosion resistance and insulating properties as taught by Otsuki.”

The Examiner asserts, “Okase and Otsuki disclose the processing system substantially as claimed and as described above.”

The Examiner admits that “Okase and Otsuki fail to explicitly teach a first insulation assembly coupled between the thermal treatment system and the chemical treatment system, the first thermal insulation assembly defining a common opening configured for transferring the substrate between the chemical treatment chamber and the temperature controlled thermal treatment chamber and a second thermal insulation assembly coupled to the thermal treatment system, the second thermal insulation assembly having a transfer opening configured for transferring the substrate therethrough.

The Examiner asserts that “Carpenter teaches the use of temperature isolating structures (Figure 1, 15) comprising a thermally insulative mass of material received between a transfer chamber (12) and chambers (14) attached thereto in a cluster tool for the purpose of more effectively reducing heat transfer between the chambers than would otherwise occur in the absence of said mass of material (abstract). Note: If the temperature isolating structures were provided in the apparatus of Okase at locations around the transfer chamber, a common first thermal insulation assembly could be located at gate valves G1 and/or G2, as claimed, for example to introduce substrates into the cluster tool.

The Examiner admits, “Carpenter does not explicitly teach that the temperature isolating structures can be received at locations where the substrate enters and exits the overall system, one of ordinary skill in the art exercising ordinary common sense, creativity and logic would readily envision such a scenario for the purpose providing further thermal control over an entire processing system.”

The Examiner asserts that “A second thermal insulation assembly could be located at either of the gate valves G6 or G7 leading to the thermal treatment systems 8 and 10. Further, the courts have ruled that “the test of obviousness is not whether features of the secondary reference may be bodily incorporated into the primary reference's structure, nor whether the claimed invention is expressly suggested in any one

or all of the references, rather the test is what the combined teachings would have suggested to those of ordinary skill in the art.” Ex parte Martin 215 USPQ 543, 544 (PO Bd Pat App 1981).”

The Examiner asserts that “It would have been obvious to one of ordinary skill in the time the Applicant's invention was made to have provided a first insulation assembly coupled between the thermal treatment system and the chemical treatment system, the first thermal insulation assembly defining a common opening configured for transferring the substrate between the chemical treatment chamber and the temperature controlled thermal treatment chamber and a second thermal insulation assembly coupled to the thermal treatment system, the second thermal insulation assembly having a transfer opening configured for transferring the substrate therethrough in Okase and Otsuki in order to more effectively reduce heat transfer between the chambers than would otherwise occur in the absence of said mass of material as taught by Carpenter.”

Applicants respectfully traverse these rejections.

MPEP § 2141 states:

“The question of obviousness must be resolved on the basis of these factual determinations. While each case is different and must be decided on its own facts, the Graham factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis. The Graham factors were reaffirmed and relied upon by the Supreme Court in its consideration and determination of obviousness in the fact situation presented in KSR, 550 U.S. at ___, 82 USPQ2d at 1391 (2007). The Supreme Court has utilized the Graham factors in each of its obviousness decisions since Graham. See Sakraida v. Ag Pro, Inc., 425 U.S. 273, 189 USPQ 449, reh’g denied, 426 U.S. 955 (1976); Dann v. Johnston, 425 U.S. 219, 189 USPQ 257 (1976); and Anderson’s-Black Rock, Inc. v. Pavement Salvage Co., 396 U.S. 57, 163 USPQ 673 (1969). As stated by the Supreme Court in KSR, “While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.” KSR, 550 U.S. at ___, 82 USPQ2d at 1391. Office personnel fulfill the critical role of factfinder when resolving the Graham inquiries. It must be remembered that while the ultimate determination of

obviousness is a legal conclusion, the underlying Graham inquiries are factual. When making an obviousness rejection, Office personnel must therefore ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied. In certain circumstances, it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done. Factual findings made by Office personnel are the necessary underpinnings to establish obviousness.

Once the findings of fact are articulated, Office personnel must provide an explanation to support an obviousness rejection under 35 U.S.C. 103. 35 U.S.C. 132 requires that the applicant be notified of the reasons for the rejection of the claim so that he or she can decide how best to proceed. Clearly setting forth findings of fact and the rationale(s) to support a rejection in an Office action leads to the prompt resolution of issues pertinent to patentability.”

The Applicants believe that Examiner has not clearly and correctly set forth the findings of fact and the rationale(s) to support one or more of the rejection in the Office Action and the Applicants believe that the rejections based on incorrect or unclear findings of fact are improper and should be withdrawn.

When explaining the rejection of Claim 1, the Examiner asserts that “A second thermal insulation assembly could be located at either of the gate valves G6 or G7 leading to the thermal treatment systems 8 and 10. Further, the courts have ruled that “the test of obviousness is not whether features of the secondary reference may be bodily incorporated into the primary reference's structure, nor whether the claimed invention is expressly suggested in any one or all of the references, rather the test is what the combined teachings would have suggested to those of ordinary skill in the art.” Ex parte Martin 215 USPQ 543, 544 (PO Bd Pat App 1981).”

The Applicants disagree with this “factual finding” since this reference to “Ex parte Martin 215 USPQ 543, 544 (PO Bd Pat App 1981)” could not be found in the MPEP. The Applicants believe that this rejection of Claim 1 is improper and should be withdrawn because the rejection is based on an incorrect factual finding.

The Examiner asserts that “With respect to claim 2, in line with the teachings of Otsuki as described above, it would have been obvious of ordinary skill in the art at the time the Applicant's was made to have provided a protective coating on any part of the first and/or the second thermal insulation assemblies that may come in contact with processing conditions, either purposefully or inadvertently. There is always a chance of inadvertent exposure in a cluster tool.”

The Examiner asserts that “With respect to claims 7 and 17: described above is the teaching of the protective barrier on the interior surface of the chemical treatment chamber and the temperature controlled thermal treatment chamber comprises at least one of Y_2O_3 , Sc_2O_3 , Sc_2F_3 , YF_3 , La_2O_3 , CeO_2 , Eu_2O_3 , and DyO_3 .

The Examiner asserts that “With respect to claims 9 and 19, Okase teaches the chemical treatment system and the thermal treatment system each further comprise a temperature controlled substrate holder, (Fig. 2 item 36) and (Fig 14, 142), respectively. The teachings of Otsuki, described above, provide a teaching of providing a protective barrier coating on an exposed portion thereof, as claimed.

The Examiner asserts that “With respect to Claims 20 and 22: as described above the protective barrier of Otsuki can be formed on any exposed surface that might need protection. This would include the surface of a gate valve assembly. Also as described above, per Otsuki, the protective barrier layer would comprise at least one of Y_2O_3 , Sc_2O_3 , Sc_2F_3 , YF_3 , La_2O_3 , CeO_2 , Eu_2O_3 , and DyO_3 .

The Examiner asserts that “With respect to Claim 27: Okase discloses a processing system, wherein the thermal treatment system further comprises a substrate lifter assembly coupled to the thermal treatment chamber for vertically translating the substrate between a transfer plane and the substrate holder (Fig. 2 Item 62).

The Examiner has rejected Claims 3, 13, 31, 36- 38 and 43 under 35 U.S.C. 103(a) as being unpatentable over Okase, Otsuki and Carpenter as applied to claims 1-2, 7, 9, 17, 19- 20, 22 and 27 above, and further in view of Carducci (US 2003/0037880 A1).

The Examiner asserts, “Okase, Otsuki and Carpenter disclose a processing system substantially as claimed and as described above and including a temperature controlled substrate holder mounted within the chemical treatment chamber and the thermal treatment system, each having a protective layer formed on an exposed surface. See

above. Also disclosed are a vacuum pumping system coupled to the chemical treatment chamber (column 13, row 65 through column 14, row 7) and a gas distribution plate (182) comprising a plurality of gas injection orifices (188). As the gas distribution plate is clearly exposed to processing conditions, it would have been obvious to form a protective barrier layer on its exposed surface, as well as the orifices therein, per the teachings of Otsuki.

The Examiner admits that “However, Okase, Otsuki and Carpenter fail to explicitly disclose that the gas distribution plate is coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber; and the processing system further comprises a control system coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate.

The Examiner asserts that “Carducci teaches a gas distribution plate is coupled to a temperature controlled gas distribution system (multiple part numbers, e.g. Figure 1, 102, 103, 105) for introducing a process gas into a chemical treatment chamber (100); and the processing system further comprises a control system (Figure 1, 140, paragraph 68) coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate in order to facilitate control of the chamber (paragraph 73).

The Examiner asserts that “At the time of invention, it would have been obvious to a person of ordinary skill in the art to have provided the gas distribution plate coupled

to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber; and the processing system further comprises a control system coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate in Okase, Otsuki and Carpenter in order to facilitate control of the chamber as taught by Carducci.”

The Examiner asserts that “With respect to claims 31, 36 and 37, each of the recitations contained therein in the descriptions and teachings of the above identified prior art.”

The Examiner asserts that “With respect to claims 38 and 43, in addition to the description and teaching of Okase, Otsuki and Carpenter provided above, Okase further teaches the temperature controlled thermal treatment chamber comprising a vacuum pumping system (column 5, rows 39-45); and a temperature controlled upper assembly (72).”

The Examiner has rejected Claims 28 and 30 under 35 U.S.C. 103(a) as being unpatentable Okase, Otsuki and Carpenter as applied to claims 1-2, 7, 9, 17, 19-20, 22 and 27 above, and further in view of Perlov (US 2002/0170672 A1).

The Examiner asserts, “Okase, Otsuki, and Carpenter disclose a processing system substantially as claimed and as described above.”

The Examiner admits that “However, Okase, Otsuki and Carpenter do not expressly state the substrate lifter assembly comprises a blade having three or more tabs for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface, and a drive system for vertically translating the substrate between the substrate holder and a transfer plane.

The Examiner asserts that “Perlov teaches the substrate lifter assembly comprises a blade having three or more tabs (Fig. 1 Items 25a-c) for receiving the substrate and

having a protective barrier formed on at least a portion of an exposed surface (Paragraph 27 Lines 1-4), and a drive system for vertically translating the substrate between the substrate holder and a transfer plane (Fig 2 Item 24).”

The Examiner asserts that “At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the apparatus disclosed in Okase, Otsuki and Carpenter including the substrate lifter assembly comprises a blade having three or more tabs for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface, and a drive system for vertically translating the substrate between the substrate holder and a transfer plane in view of the teaching of Perlov. The suggestion or motivation for doing so would have been to provide a lift that does not produce particles or scratch a substrate during contact (Paragraph 27 Lines 1-5).”

The Examiner asserts, “With respect to claim 30, it is also noted that Perlov teaches a processing system, wherein a protective barrier is formed on exposed surfaces (Paragraph 27 Lines 1-5). It would have also been obvious to one of ordinary skill in the art to utilize the teachings of Otsuki, which state that it is beneficial to provide protective barrier layers comprising the claimed materials on exposed surfaces of parts, such as the blade.”

The Applicants respectfully submit that the rejections of Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are improper and should be withdrawn because the Applicants believe that the Examiner’s obviousness (103a) rejections are NOT based on the Applicants’ invention as “a whole” as required by law. In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

The Applicants respectfully submit that the rejections of Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, and 30 are improper and should be withdrawn because Claims 2-3, 7, 9, 13, 17, 19-20, 22, 27-28, and 30 depend from Claim 1, and the Applicants believe that the Examiner’s rejection of Claim 1 is improper because the rejection of Claim 1 is based on one or more incorrect factual findings documented herein.

The Applicants respectfully submit that the rejections of Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are improper and should be withdrawn because the Applicants believe that the Examiner's obviousness (103a) rejections are based on improper hindsight reasoning and are improper because the Examiner is using "knowledge gleaned only from applicant's disclosure" to make the rejections. *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

The Applicants respectfully submit that the rejections of Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are improper and should be withdrawn because the Applicants believe that the Examiner's obviousness (103a) rejections are based on improper hindsight reasoning and are improper because the Examiner is using the Applicants' invention as a template to select prior art references to render the Applicants' invention obvious. The Examiner cannot "use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention" *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

The Applicants have amended claim 1 to more clearly recite the invention. The amended claim 1 more clearly recites that the Applicants' invention comprises: "a chemical treatment system for chemically altering exposed surface layers on the substrate using a first gas comprising NH₃ and HF, wherein the chemical treatment system comprises a temperature controlled chemical treatment chamber having a protective barrier layer formed on at least a portion of an interior surface;" and the Applicants assert that Claim 1 as amended is patently distinguishable over the cited references.

The Applicants have amended Claim 1 to more clearly recite the invention and believe the "35 U.S.C. 103(a)" rejections of Claims 2, 3, 7, 9, 13, 17, 19, 20, 22, 27, 28, and 30 should be withdrawn because Claims 2, 3, 7, 9, 13, 17, 19, 20, 22, 27, 28, and 30 are dependent from amended Claim 1, and the Applicants believe that amended Claim 1 is patently distinguishable over the cited references.

The Applicants have amended claim 31 to more clearly recite the invention. The amended claim 31 more clearly recites that the Applicants' invention comprises: "a gas distribution plate comprising a plurality of gas injection orifices, the gas distribution plate

being coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber, wherein the process gas comprises NH₃ and HF;”, and the Applicants assert that Claim 31 as amended is patently distinguishable over the cited references.

The Applicants have amended Claim 31 to more clearly recite the invention and believe the “35 U.S.C. 103(a)” rejections of Claims 36 and 37 should be withdrawn because Claims 36 and 37 are dependent from amended Claim 31, and the Applicants believe that amended Claim 31 is patently distinguishable over the cited references.

The Applicants have amended claim 38 to more clearly recite the invention. The amended claim 38 more clearly recites that the Applicants’ invention comprises: “a temperature controlled substrate holder mounted within the thermal treatment chamber, wherein the temperature controlled substrate holder comprises a temperature control component, an underlying mating component, and a thermal insulation gap is configured to provide additional thermal insulation between the temperature control component and the underlying mating component;”, and the Applicants assert that Claim 38 as amended is patently distinguishable over the cited references.

The Applicants have amended Claim 38 to more clearly recite the invention and believe the “35 U.S.C. 103(a)” rejection of Claim 43 should be withdrawn because Claim 43 is dependent from amended Claim 38, and the Applicants believe that amended Claim 38 is patently distinguishable over the cited references.

Each of the Examiner’s rejections having been addressed, the Applicants respectfully submit that Claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are now in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw the obvious rejections of the claims and pass this application quickly to issuance.

If the undersigned agent has overlooked a teaching in any of the cited references that is relevant to the Allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or

questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned agent at 480-539-2105 or by email at jim.kleotka@us.tel.com.

Charge Deposit Account

Please charge our Deposit Account No. 50-3451 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

/James Kleotka/

Date: 08/05/2008

James Kleotka
Agent for Applicant
Registration No. 44839

TOKYO ELECTRON U.S. HOLDINGS, INC.

4350 W. Chandler Blvd., Suite 10

Chandler, AZ 85226

Tel. 480-539-2105

Fax. 480-539-2100